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Docket No.: 5000-0189PUS1  
(PATENT)

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Patent Application of:  
Jordi TORMO I BLASCO et al.

Application No.: 10/590,925

Confirmation No.: Not Yet Assigned

Filed: August 28, 2006

Art Unit: N/A

For: FUNGICIDAL MIXTURES

Examiner: Not Yet Assigned

**LETTER**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

Subsequent to the filing of the above-identified application on August 28, 2006, attached hereto is a (Form PCT/IB/373), and an English translation of the Written Opinion Of The International Searching Authority (Form PCT/ISA/237) that should be made of record in the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or to credit any overpayment to Deposit Account No. 02-2448 for any

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additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Dated: January 3, 2007

Respectfully submitted,

By 

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Attachment(s)

# PATENT COOPERATION TREATY

# PCT

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference <b>0000055440</b>	<b>FOR FURTHER ACTION</b>		See item 4 below
International application No. <b>PCT/EP2005/002684</b>	International filing date ( <i>day/month/year</i> ) <b>14 March 2005 (14.03.2005)</b>	Priority date ( <i>day/month/year</i> ) <b>15 March 2004 (15.03.2004)</b>	
International Patent Classification (8th edition unless older edition indicated) <b>See relevant information in Form PCT/ISA/237</b>			
Applicant <b>BASF AKTIENGESELLSCHAFT</b>			

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 *bis*.1(a).

2. This REPORT consists of a total of 9 sheets, including this cover sheet.

In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

- |                                     |              |   |
|-------------------------------------|--------------|---|
| <input checked="" type="checkbox"/> | Box No. I    | Basis of the report   |
| <input type="checkbox"/>            | Box No. II   | Priority  |
| <input type="checkbox"/>            | Box No. III  | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability  |
| <input type="checkbox"/>            | Box No. IV   | Lack of unity of invention  |
| <input checked="" type="checkbox"/> | Box No. V    | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/>            | Box No. VI   | Certain documents cited   |
| <input type="checkbox"/>            | Box No. VII  | Certain defects in the international application  |
| <input type="checkbox"/>            | Box No. VIII | Certain observations on the international application   |

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Date of issuance of this report <b>01 November 2006 (01.11.2006)</b>
Facsimile No. +41 22 338 82 70	Authorized officer <div style="text-align: center; font-weight: bold; margin-top: 10px;">Yolaine Cussac</div> e-mail: pt11@wipo.int

# PATENT COOPERATION TREATY

TRANSLATION

From the  
INTERNATIONAL SEARCHING AUTHORITY

## PCT

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

To:

Date of mailing **See form PCT/ISA/210**  
(day/month/year)

Applicant's or agent's file reference  
**0000055440**

**FOR FURTHER ACTION**  
See paragraph 2 below

International application No.  
**PCT/EP2005/002684**

International filing date (day/month/year)  
**14.03.2005**

Priority date (day/month/year)  
**15.03.2004**

International Patent Classification (IPC) or both national classification and IPC  
**A01N47/34**

Applicant  
**BASF AKTIENGESELLSCHAFT**

**1. This opinion contains indications relating to the following items:**

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

**2. FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

**3. For further details, see notes to Form PCT/ISA/220.**

Name and mailing address of the ISA/EP

Authorized officer

Facsimile No.

Telephone No.

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Box No. I

Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.  
☐ This opinion has been established on the basis of a translation from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (under Rule 12.3 and 23.1(b)).
2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material  
☐ a sequence listing  
☐ table(s) related to the sequence listing
  - b. format of material  
☐ in written format  
☐ in computer readable form
  - c. time of filing/furnishing  
☐ contained in the international application as filed.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

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**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Claims <u>1-10</u>	YES
	Claims _____	NO
Inventive step (IS)	Claims <u>1-10</u>	YES
	Claims _____	NO
Industrial applicability (IA)	Claims <u>1-10</u>	YES
	Claims _____	NO

**2. Citations and explanations:**

Reference is made to the following reference documents  
(D1-D6) which are cited in the international search  
report:

D1: US-B1-6 268 371  
D2: WO 98/46607 A  
D3: US-A-4 940 722  
D4: US-A-5 593 996  
D5: EP-A-0 988 790  
D6: EP-A-0 677 246

**Novelty**

The present application meets the requirement of PCT  
Article 33(1) in conjunction with PCT Article 33(2)  
because the subject matter of claims 1-10 is novel.

Subject matter of independent claim 1 is a fungicidal  
mixture of thiophanate-methyl and a specific fungicidal  
triazolopyrimidine (referred to as TP1 hereinbelow) in a  
synergistically active amount. Claim 3 claims a  
composition which comprises a carrier and the mixture.  
The remaining independent claims 4, 9 and 10 refer to a  
method of controlling plant-pathogenic harmful fungi by

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citations and explanations supporting such statement

means of such a mixture, to seed resulting from such a method which comprises such a mixture, and to the use of the two compounds for the preparation of compositions for controlling rice-pathogenic harmful fungi.

D1 (see the passages cited in the international search report) discloses synergistic mixtures of triazolopyrimidines which are known from, *inter alia*, D4 with melanin biosynthesis inhibitors such as carpropamid, pyroquilon and fenoxanil. These mixtures are particularly effective against rice pathogens (*Pyricularia oryzae*, *Rhizoctonia solani* and *Cochliobolus miyabeanus*, which causes brown spot disease). The preferred triazolopyrimidines, which are referred to in D1 as azolopyrimidines, A, C and D, (hereinbelow referred to as TPa, TPb and TPc, respectively) are the 6-(2-Cl-6-F-phenyl), the 7-(2,2,2-trifluoroethylamino) and the 7-(1,1,1-trifluoropropyl-2-ylamino) analogues of TP1.

D2 (see the passages cited in the international search report) specifically discloses the compound TP1 (exemplary compound 2), *inter alia*. The compound is compared with TPa with regard to its activity against powdery mildew (*uncinula necator*) on grapevines and found to be superior. The possibility of mixing it with other fungicides, among which thiophanate-methyl is also mentioned, perhaps with obtaining a synergistic effect, is mentioned, but not carried out.

D3 (see the passages cited in the international search report) discloses synergistic mixtures of diniconazole, a fungicide which inhibits the ergosterol biosynthesis,

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with a benzimidazole-thiophanate fungicide, such as, for example, benomyl, thiophanate-methyl and carbendazim. These are suitable for the treatment of seed and prove to be effective against, *inter alia*, the rice-pathogenic fungi *Gibberella fujikuroi* and *Cochliobolus miyabeanus* on rice seed.

D4 (see the passages cited in the international search report) discloses certain fungicidal triazolopyrimidines, among which TPa. The activity against *Pyricularia oryzae* on rice is demonstrated (see D4, examples 225 and 226).

D5 (see the passages cited in the international search report) discloses synergistic mixtures of triazolopyrimidines of a general formula, which also covers TP1, with 22 other fungicides or classes of fungicides, among which also benomyl - which belongs to the class of the benzimidazole fungicides, of which class thiophanate is a precursor - but not thiophanate-methyl itself. The preferred azolopyrimidines A, B and C, which are used in examples, are the abovementioned TPa, TPb and TPc, respectively. In one example the activity of a mixture of TP1 and benomyl against *Botrytis cinerea* on apples is shown (example 6).

D6 (see the passages cited in the international search report) discloses synergistic mixtures of ipconazole, also an ergosterol biosynthesis-inhibitory fungicide, with a benzimidazole-thiophanate fungicide, such as, for example, benomyl, thiophanate-methyl and carbendazim. These are suitable for the treatment of seed and prove to be effective against, *inter alia*, the rice-pathogenic



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fungus *Gibberella fujikuroi* on rice seed.

Thus, none of the abovementioned citations discloses the specific mixture which is the subject matter of the present application.

**Inventive step**

The present application meets the requirement of PCT Article 33(1) in conjunction with PCT Article 33(3) because the subject matter of claims 1-10 involves an inventive step.

In the light of the description and of the closest prior art of the reference document D1, the problem on which the application is based can be considered to be the provision of synergistic mixtures of triazolopyrimidines with other fungicides which are suitable for controlling rice pathogens, i.e. which combine a high systemicity with a good activity against pathogens such as *Pyricularia oryzae*, *Cochliobolus miyabeanus* and *Corticium sasakii* (syn. *Rhizoctonia solani*).

The proposed solution is characterized by the use of the specific triazolopyrimidine TP1 in combination with thiophanate-methyl.

To solve the same problem (see above), the closest prior art D1 proposes to use certain 2,4,6-trifluorophenyltriazolopyrimidines in combination with known melanin biosynthesis inhibitors.

The solution proposed in the present application differs

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both with regard to the selected triazolopyrimidine (TP1) and with regard to the selected mixing partner (thiophanate-methyl).

It is known from D2 that TP1 and similar triazolopyrimidines have very good activity against the rice pathogens *Pyricularia grisea f. sp. oryzae* (teleomorph: *Magnaporthe gr. f. sp. oryzae*) and *Rhizoctonia solani*. Reference is made to the citation D4 as an earlier publication of this general class of substances; it must be noted that the compounds selected in D2 have an increased systemicity and activity against rice diseases, which is evident in comparison with the compounds mentioned specifically in D4. Moreover, there is proposed a mixture with other fungicides which might lead to a synergistic effect.

D5 discloses mixtures of triazolopyrimidines of a general formula which comprises not only TPa, TPb and TPc, but also TP1, with other fungicides (see above). However, only TPa, TPb and TPc, which are known from the citations D1 and D4, are in fact used, and thiophanate-methyl is not among the selected mixing partners. The synergistic mixtures are tested against a number of harmful fungi, such as species of the genera *Blumeria*, *Botrytis*, *Septoria*, *Erysiphe* and *Puccinia*, but not against one of the typical rice pathogens. Moreover, the tests are carried out on a variety of crop plants such as wheat, barley, apples, cucumbers, tomatoes and grapevines, but not on rice.

It was also known from the prior art (D3 and D6, see

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above) that fungicide mixtures which comprise thiophanate-methyl can be highly active against rice-pathogenic fungi such as *Gibberella fujikuroi* and *Cochliobolus miyabeanus*. That document discloses fungicides from the class of the ergosterol biosynthesis inhibitors as synergistically acting mixing partners for thiophanate-methyl.

In the light of this prior art, it was not an obvious measure starting from D1 to substitute in the mixtures disclosed therein TPa, TPb or TPc by TP1 and simultaneously to substitute the melanin biosynthesis inhibitors by thiophanate-methyl, whose structure is quite different, or else, starting from D3 or D6, to substitute the ergosterol biosynthesis inhibitors by TP1, which is structurally completely different and presumably also has a completely different mechanism of action; even less would a person skilled in the art have expected that such a mixture would also show a synergistic effect against *Cochliobolus miyabeanus* as is demonstrated in the present application.

The proposed and claimed solution of the problem is therefore not obvious, but involves an inventive step.

**Industrial applicability**

The subject matter of claims 1-10 is considered to be industrially applicable (PCT Article 33(1) and (4)).